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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Niels Beier

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EXAMINER

WON, MICHAEL YOUNG

ART UNIT

PAPER NUMBER

2155

DATE MAILED: 07/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/967,084

Applicant(s)

BEIER ET AL.

Examiner

Michael Y. Won

Art Unit

2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 22-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 22-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This action is in response to the amendment filed April 11, 2006 and the Request for Continued Examination filed May 25, 2006.
2. Claims 1, 8, and 22 have been amended.
3. Claims 1-10 and 22-32 have been examined and are pending with this action.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10 and 22-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (US 2002/0116527 A1) in view of Molitor (US 6,661,799 B1).

### **INDEPENDENT:**

As per ***claim 1***, Chen teaches a method comprising:

receiving a packet at a network device (see Fig.2 and page 1, [0018]: *"an incoming packet is transmitted to the lookup engine"*), the packet including a header (see page 1, [0018]: *"the header portion of the incoming packet"*) and a payload (inherency);

tagging the packet, by a first packet-processing application of a plurality of packet processing applications, with a cache lookup key based upon original contents of the header (see page 1, [0010]: *"generating an I.I.D. hash index for the incoming packet in response to the address information of the incoming packet"* and [0011]: *"get address information from a header portion of an incoming packet... And generate an I.I.D. hash index"*), the cache lookup key indicating where in a unified cache a cache entry corresponding to the packet will be stored (implicit: see page 1, [0002], [0007], and [0009]), the first packet-processing application modifying the header of the packet (implicit: see page 1, [0011]: *"get address information from a header portion"* and page 2, [0019]: *"Per-hop behavior (PHB), and next hop"*); and

the second packet-processing application accessing the cache entry from the unified cache using the cache lookup key added by the first packet-processing application (see page 2, [0025]: *"the header information of the incoming packet will be used as a flow address for looking up the flow table"* and [0027]: *"A 'flow' is a single instance of an application-to application flow of packets"*).

Although Chen teaches of providing the tagged packet to the second packet processing application (see page 2, [0025]: *"the header information of the incoming packet will be used as a flow address for looking up the flow table"* and [0027]: *"A 'flow'"*

*is a single instance of an application-to application flow of packets*”), Chen does not explicitly teach of the first packet-processing application initiating a second packet-processing application of the plurality of packet-processing applications.

Molitor teaches of the first packet-processing application initiating a second packet-processing application of the plurality of packet-processing applications (see col.7, lines 12-26 and col.8, lines 4-22).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the teachings of Molitor within the system of Chen by implementing a packet-processing application initiating another packet-processing application within the method and program stored on a machine-readable medium because Chen teaches that the hashing mechanism is adaptable to any network device such as a router (see page 1, [0017]) and one of ordinary skill in the art know that plurality of routers, each comprising packet-processing application, are employed in the Internet wherein information is passed there between. Therefore, one of ordinary skill in the art would implement a packet-processing application initiating another packet-processing application when information is traveling from a source to a destination via plurality of routers.

As per **claim 8**, Chen teaches a method comprising the steps of:

a step for determining whether a cache lookup key is present in a packet descriptor associated with a received packet (see page 4, [0054]: “*for insertion and table lookup*”);

a step for performing a lookup in a unified cache with the cache lookup key if it is determined that the cache lookup key is present in the packet descriptor (see page 4, [0054]: *"for insertion and table lookup"*);

a step for creating a new cache entry in the unified cache based upon information in a header of the received packet and tagging the packet (see page 1, [0010]: *"generating an I.I.D. hash index for the incoming packet in response to the address information of the incoming packet"* and [0011]: *"get address information from a header portion of an incoming packet... And generate an I.I.D. hash index"*) if it is determined that the cache lookup key is not present in the packet descriptor or the lookup does not locate an appropriate existing cache entry (see page 2, [0025]: *"For any new arrival of the incoming packet, the packet will lead to a flow table lookup miss. Then the packet is passed to CPU"* and [0026]: *"CPU 13 creates a new entry in the flow table 121 for the incoming packets"*);

a step for conveying the cache lookup key to a packet filtering packet-processing task (see page 2, [0032] & [0033]); and

a step for updating an existing cache entry with module-specific information (see page 2, [0031]).

Chen does not explicitly teach of a NAT packet-processing task.

Molitor teaches of a NAT packet-processing task (see col.4, lines 54-57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the teachings of Molitor within the system of Chen by implementing Network Address Translation (NAT) packet-processing task within the

method because Molitor teaches that Network Address Translation (NAT) are usually placed within IP networks at the border between two disparate address realms (see col.1, lines 16-19) to allow communication between two applications located at each realm. Therefore, since Chen teaches of application-to-application flow of packets (see page 2, [0027] in an network consisting of the Internet (see page 2, [0019]: "*IP*"), one of ordinary skill in the art would employ NAT since this allows applications at disparate realms to communicate.

As per **claim 22**, Chen teaches a machine-readable medium having stored thereon data representing instructions that, if executed by one or more processors of a network device, cause the one or more processors to:

receiving a packet (see Fig.2 and page 1, [0018]: "*an incoming packet is transmitted to the lookup engine*") including a header (see page 1, [0018]: "*the header portion of the incoming packet*") and a payload (inherency);

tag the packet, by a first packet-processing application of a plurality of packet-processing applications, with a cache lookup key based upon original contents of the header (see page 1, [0010]: "*generating an I.I. D. hash index for the incoming packet in response to the address information of the incoming packet*" and [0011]: "*get address information from a header portion of an incoming packet... And generate an I.I.D. hash index*"), the cache lookup key indicating where in a unified cache a cache entry corresponding to the packet will be stored (implicit: see page 1, [0002], [0007], and [0009]); the first packet-processing application modifying the header of the packet

(implicit: see page 1, [0011]: *"get address information from a header portion"* and page 2, [0019]: *"Per-hop behavior (PHB), and next hop"*); and

use the cache lookup key rather than generating a new cache lookup key based upon current contents of the header by a second application accessing the cache entry from the unified cache subsequent to the tagging by the first packet-processing application (see page 2, [0025]: *"the header information of the incoming packet will be used as a flow address for looking up the flow table"* and [0027]: *"A 'flow' is a single instance of an application-to application flow of packets"*).

Although Chen teaches of providing the tagged packet to the second packet processing application (see page 2, [0025]: *"the header information of the incoming packet will be used as a flow address for looking up the flow table"* and [0027]: *"A 'flow' is a single instance of an application-to application flow of packets"*), Chen does not explicitly teach of the first packet-processing application initiating a second packet-processing application of the plurality of packet-processing applications.

Molitor teaches of the first packet-processing application initiating a second packet-processing application of the plurality of packet-processing applications (see col.7, lines 12-26 and col.8, lines 4-22).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ the teachings of Molitor within the system of Chen by implementing a packet-processing application initiating another packet-processing application within the method and program stored on a machine-readable medium because Chen teaches that the hashing mechanism is adaptable to any network device



such as a router (see page 1, [0017]) and one of ordinary skill in the art know that plurality of routers, each comprising packet-processing application, are employed in the Internet wherein information is passed there between. Therefore, one of ordinary skill in the art would implement a packet-processing application initiating another packet-processing application when information is traveling from a source to a destination via plurality of routers.

**DEPENDENT:**

As per **claims 2 and 23**, which respectively depend on claims 1 and 22, Chen further teaches wherein said tagging the packet with a cache lookup key comprises populating a lookup key field of an internal packet descriptor corresponding to the packet with a hash value (see pages 2-3, [0034]).

As per **claims 3 and 24**, which respectively depend on claims 2 and 22, Chen teaches wherein the packet comprises an Internet Protocol (IP) packet and the cache lookup key is based upon a source IP address of the header, a destination IP address of the header, a source port of the header, a destination port of the header, and a protocol value in the header (see page 2, [0019]).

As per **claims 4, 6, 10, 25, 27, and 28**, which respectively depend on claims 1, 1, 8, 22, 26, and 22, Chen teaches all the limitations including wherein the plurality of packet-processing applications includes applying packet filtering and packet routing or forwarding (see page 2, [0032]), but Chen does not explicitly teach wherein the plurality

of packet-processing applications includes applying one or more of Network Address Translation (NAT).

Molitor teaches of a NAT packet-processing task (see col.4, lines 54-57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the teachings of Molitor within the system of Chen by implementing Network Address Translation (NAT) packet-processing task within the method because Molitor teaches that Network Address Translation (NAT) are usually placed within IP networks at the border between two disparate address realms (see col.1, lines 16-19) to allow communication between two applications located at each realm. Therefore, since Chen teaches of application-to-application flow of packets (see page 2, [0027] in an network consisting of the Internet (see page 2, [0019]: "*IP*"), one of ordinary skill in the art would employ NAT since this allows applications at disparate realms to communicate.

As per **claims 5 and 26**, which respectively depend on claims 4 and 22, Chen further teaches wherein the plurality of packet-processing applications are distributed among at least two processors of the network device (implicit: see title and page 1, [0017]).

As per **claims 7 and 29**, which respectively depend on claims 6 and 28, Chen teaches of further comprising the second packet-processing application updating the cache entry with information specific to the second packet-processing application by using the cache lookup key to access the cache entry (implicit: see page 1, [0011]: "*get*

*address information from a header portion” and page 2, [0019]: “Per-hop behavior (PHB), and next hop”).*

As per **claims 9 and 30**, which respectively depend on claims 8 and 22, Chen further teaches wherein the unified cache is implemented as a hash table and tagging the packet comprises generating a hash value based upon at least a source address and a destination address in the header and storing the hash value in the packet descriptor (see page 4, [0053]).

As per **claim 31**, which depends on claim 22, Chen further teaches wherein the network device comprises a router (see page 1, [0017]).

As per **claim 32**, which depends on claim 22, Chen further teaches wherein the network device comprises a switch (see page 1, [0017]).

### ***Response to Arguments***

5. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Based on the amendment and after further consideration and searching, the examiner has found a new reference Chen et al. (US 2002/0116527 A1), which better teaches the functionalities of the broadly claimed invention. Furthermore Chen in view of Molitor (US 6,661,799 B1), clearly and explicitly teaches all the limitations of independent claims 1, 8, and 22.

***Conclusion***

6. For the reasons above, claims 1-10 and 22-32 have been rejected and remain pending.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Y. Won whose telephone number is 571-272-3993. The examiner can normally be reached on M-Th: 7AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar can be reached on 571-272-4006. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael Won

A handwritten signature in black ink, appearing to read "Michael Won", with a stylized flourish at the end.

July 14, 2006